Claims

1. A method of producing a superabsorbent polymer product for use in agricultural applications, comprising:

providing grafting reactants and a starch;

graft polymerizing the grafting reactants onto the starch to form a starch graft copolymer;

saponifying the starch graft copolymer;

precipitating the saponified starch graft copolymer; and

granularizing the precipitated starch graft copolymer to form particles of superabsorbent polymer product.

2. The method of claim 1, wherein the grafting reactants include an initiator and an acrylonitrile.

3. The method of claim 2, wherein the grafting reactants further include a chemical selected from the group consisting essentially of acrylic acid, acrylamide, and 2-acrylonitrile-2-methyl-propanesulfonic acid.

4. The method of claim 2, wherein the starch and the acrylonitrile are present in a weight ratio of between about 1:2 and about 1:5.

5. The method of claim 2, wherein the initiator is a cerium salt.

6. The method of claim 2, wherein the initiator is ceric ammonium nitrate.

7. The method of claim 1, wherein the starch is selected from a group consisting essentially of pure starches, flours, and meals.

8. The method of claim 1, wherein the starch is a gelatinized starch.

9. The method of claim 1, wherein the starch is cornstarch.

10. The method of claim 1, wherein the particles have a particle size that is about 200 mesh or less.

11. The method of claim 10, wherein the particle size is between about 5 mesh and about 50 mesh.

12. The method of claim 10, wherein the particle size is between about 8 mesh and about 25 mesh.

13. The method of claim 1, wherein precipitating the saponified starch graft copolymer involves mixing an alcohol with the saponified starch graft copolymer.

14. The method of claim 13, wherein the alcohol is selected from the group consisting essentially of methanol, ethanol, propanol, and isopropanol.

15. A method of using the superabsorbent polymer product produced by the method of claim 1 to increase crop production, comprising:

providing a seed planted in a furrow;

providing a superabsorbent polymer product having a particle size that is less than about 50 mesh; and

applying the superabsorbent polymer product to the furrow.

16. A method of using the superabsorbent polymer product produced by the method of claim 1 to increase crop production, comprising:

providing a seed;

providing a superabsorbent polymer product having a particle size that is between about 75 and about 200 mesh; and

applying the superabsorbent polymer product to the seed.

17. A method of using a superabsorbent polymer product produced by the method of claim 1 to increase crop production, comprising:

providing a root;

preparing a gel solution including a superabsorbent polymer product having a particle size that is between about 30 mesh and about 100 mesh; and

applying the gel solution to the root.

18. The method of claim 17, wherein the gel solution includes between about 1 part of the superabsorbent polymer product and between 300 and about 700 parts water.

19. A method of using the superabsorbent polymer product produced by the method of claim 1 for use in agriculture, comprising:

providing one of a seed or a root, wherein the seed or root is selected from a group consisting essentially of alfalfa, asparagus, barley, bean, bell pepper, broccoli, canola, cantaloupe, carrot, cauliflower, celery, coriander, coreopsis, cotton, cucumber, dill, elymus glaucus, field corn, fine fescue, garlic, honeydew, kentucky bluegrass, lentil, lettuce leaf, lima bean, oat, onion, parsley, pea, pumpkin, radish, rye grass, sorghum, soybean, spinach, squash, sugar beet, sunflower, sweet corn, swiss chard, tall fescue, tomato, turnip, watermelon, wheat, white clover, wild rye, zinnia; and

treating the seed or root with the superabsorbent polymer product by applying the superabsorbent polymer product to the seed or root.

20. A superabsorbent polymer product for use in agricultural applications made in accordance with the method of claim 1.